REMARKS

The Office Action mailed September 26 , 2003, has been carefully reviewed and, in view of the following remarks, Applicants respectfully request reconsideration and allowance of claims 1-5 which are pending.

The Examiner rejected claims 1 and 2 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,215,584 to Yang et al. ("Yang"), and rejected claims 3-5 under 35 U.S.C. 103(a) as being unpatentable over Yang in view of U.S. Patent No. 6,009,220 to Chan et al. ("Chan").

Yang teaches a method for flattening the gain profile of an Erbium doped fiber-based amplifier (EDFA) which is used in a wavelength division multiplexing (WDM) optical transmission system. In short, the EDFA has a different gain profile according to the overall input power. So, if the gain profile is broken and gain tilt is generated over the wavelength area, the extent of amplification varies according to channel. When the WDM signal goes through a plurality of amplifiers, a starving phenomenon is generated and, as a result, the channel with the strongest power receives all the amplification rates. To prevent this phenomenon, the gain profile of the EDFA should be flattened within a range of 0.5 to 1 dB.

Accordingly, Yang estimates the gain profile for the entire input power in advance, stores the estimated gain profile in a memory, measures the entire input power actually inputted, controls each of the amplification units of the EDFA by using the measured entire input power, and obtains a flattened gain profile.

However, Yang does not monitor the optical performance of the WDM optical transmission system at each channel. Therefore, with Yang it is impossible to measure *the actual*

input power of each channel and the optical signal-to-noise ratio (OSNR). In other words, Yang measures only the total input power of the EDFA and calculates the power of each channel based on an assumption that the same power is being input to each channel. As a result, this method has a shortcoming in that it can be applied to a WDM transmission system of the point-to-point type only and cannot be applied to a WDM transmission system of multipoint-to-multipoint type where optical cross connects or optical add-drop multiplexers (OADM) are applied. Nor can Yang measure the wavelengths of each individual channel.

As just discussed, the object of Yang is to flatten the gain tilt of the EDFA; Yang cannot measure the characteristics of each channel if the channel characteristics of multi-channel optical signals, such as power, wavelength and OSNR, are changed. In short, the method of Yang flattens the gain profile of the EDFA by measuring amplified spontaneous emission (ASE) noise and channel power *based on the assumption that the channel characteristics are the same for all channels*. Contrary to the Examiner's reading of column 8, lines 65-67, column 9, lines 1-10 and 60-65, neither this text nor any other in Yang discloses "a signal processing means for measuring the power for each channel of the WDM optical signal, a total ASE (Amplified Spontaneous Emission) noise power, and an optical signal-to-noise ratio for each channel from the digital value from the signal converting means", as set forth in claim 1.

In direct contrast to the teaching of Yang which assumes that channel characteristics are the same for all channels, according to the present invention, it is assumed that the channel-based characteristics of multi-channel optical signals *are different*. Thus, the present invention provides an apparatus that *measures the actual optical performance of each channel* to secure the transmission performance of WDM optical transmission systems, including those systems (such as

those using OADM) in which the *optical characteristics of each channel are not the same.* This is not taught or suggested by Yang.

For at least the foregoing reasons, claim 1 is not obvious in view of Yang and is patentable thereover. Claims 2-5 are also in condition for allowance as claims properly dependent on an allowable base claim and for the subject matter contained therein. With respect to the rejection of claims 3-5 on the basis of Yang and Chan, as just set forth, Yang does not teach the invention which is set forth in claim 1, and the addition of Chan to Yang does not provide the necessary teaching or suggestion either. In fact, the Examiner relied upon Chan only as disclosing optical fiber gratings using in monitoring a WDM signal, which is quite apart from the channel-by-channel power and OSNR measurements claimed by the present invention.

With this Amendment, the application is in condition for allowance. Should the Examiner have any questions or comments, the Examiner is cordially invited to telephone the undersigned attorney so that the present application can receive an early Notice of Allowance.

Respectfully submitted,

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Date: December 29, 2003
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